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## Does mask use affect the quantitative severe acute respiratory syndrome coronavirus 2 load in the nasopharynx?



### To the Editor:

Yonker et al reported greater severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) viral loads in the nasopharynx of children during the initial symptomatic stage of disease.<sup>1</sup> As these viral loads were significantly greater than adult viral loads despite variable angiotensin-converting enzyme 2 expression among children with disease, the question is whether this is related to an inadequately counter-offensive immune response by children and/or insufficient use of masks by symptomatic children confined to their homes due to school closures. Did Yonker et al further analyze the incidence of mask use among children with disease as compared with adults with disease? It is my hypothesis that patients with disease wearing masks are breathing in hot (~95°F temperature) and humid (~80% relative humidity) microenvironments that may be “therapeutic” against SARS-CoV-2.<sup>2,3</sup> This hypothesis is based on the report by the Department of Homeland Security, Science and Technology, which has stated that at 95°F temperature and 80% relative humidity, the half-life of SARS-CoV-2 is 1 hour.<sup>4,5</sup> Yonker et al may be best equipped to confirm that in-mask microclimates may recreate a microenvironment that may be detrimental to SARS-CoV-2.<sup>1</sup>

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## References

1. Yonker LM, Neilan AM, Bartsch Y, Patel AB, Regan J, Arya P, et al. Pediatric Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2): clinical presentation, infectivity, and immune responses. *J Pediatr* 2020;227:45-52.e5.
2. Gupta D. Living with in-mask micro-climate. *Med Hypotheses* 2020;144:110010.
3. Gupta D. “Therapeutic” facemasks. *Med Hypotheses* 2020;143:109855.
4. Department of Homeland Security: Science and Technology. Estimated Surface Decay of SARS-CoV-2 (virus that causes COVID-19) on surfaces under a range of temperatures and relative humidity. <https://www.dhs.gov/science-and-technology/sars-calculator>. Accessed October 11, 2020.
5. 95.3 WBCKFM, Townsquare Media, Inc. Can sunlight or UV light kill the COVID-19 virus; it appears so. <https://wbckfm.com/can-sunlight-or-uv-light-kill-the-covid-19-virus-it-appears-so/>. Accessed October 11, 2020.

## Reply



### To the Editor:

We collected biospecimens from 192 children, <22 years of age, who presented to urgent care clinics or were hospitalized for concerns of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection or multisystem inflammatory disorder in children. We showed that children have high viral loads on days 1-2 of illness as compared with adults with severe disease with >7 days of symptoms. Although we did not observe viral load differences between children and adults when stratified by time (perhaps because of a small sample size of adults in this cohort with <7 days of symptoms), Heald-Sargent et al showed that children <5 years of age had significantly greater SARS-CoV-2 viral loads compared with adults >18 years of age.<sup>1</sup> We also showed that, in children, viral load decreases over time, as has been shown in infected adults.<sup>2</sup> We did not collect data on mask use by these children. However, the samples were collected from April to June 2020, when schools and businesses were shut down. Children were mostly at home during this time period, so mask use was likely low. However, most nonessential workers were also likely at home during this time period, so it would be difficult to compare mask use between adults and children. Universally, recommendations now include wearing a mask to mitigate the spread of infection. To compare viral load of mask wearers vs non-mask wearers going forward poses logistical and ethical challenges. The hypothesis suggesting that wearing a mask provides antiviral benefit in addition to providing a physical barrier to the virus is compelling, but our study design did not include data on mask use and, therefore, we cannot dispute nor confirm this hypothesis.

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## References

1. Heald-Sargent T, Muller WJ, Zheng X, Rippe J, Patel AB, Kocielek LK. Age-related differences in nasopharyngeal severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) levels in patients with mild to moderate coronavirus disease 2019 (COVID-19). *JAMA Pediatr* 2020;174:902-3.